CLAIMS

1. A quantum circuit characterized in that a quantum bit is represented by the polarization directions of light, a sequence of polarized light pulses representing a quantum bit string is sequentially supplied, and the amount of polarization rotation applied to a certain light pulse and the amount of phase difference are determined on the basis of a result of the measurement of polarization of the preceding input light pulse sequence, thus realizing a controlled-unitary transform.

2. The quantum circuit according to Claim 1, characterized in that the controlled-unitary transform causes the phase difference between polarization indicating a |0> state and polarization indicating a |1> state.

3. The quantum circuit according to Claim 2, characterized in that outputs of a polarization beam splitter are coupled via a polarization maintaining fiber, and a phase modulator is arranged in a position deviated from the middle point of the polarization maintaining fiber, thus causing the phase difference between the polarization indicating the |0> state and that indicating the |1> state.

4. The quantum circuit according to Claim 1, 2, or 3,

characterized in that in the light pulses representing the quantum bits, the number of photons included in one pulse is larger than 1.

5. A quantum computer including the quantum circuit according to Claim 1, 2, 3, or 4.